Modern Heating WITH NESBITT Convectors

HOMES • APARTMENTS
STORES • OFFICES

RATINGS: In conformance with Commercial Standard CS140-47, developed by the Industry and the Nat'l Bureau of Standards, U. S. Dept. of Commerce; and approved by the Convector Rating Committee.

PUBLICATION NUMBER 262

Style Comfort and Economy

For today's enlightened living, home furnishings and decoration may be early period or modern, depending on preference and plan . . . but comfort and convenience will demand the latest creations of art and science. Heating has top priority.

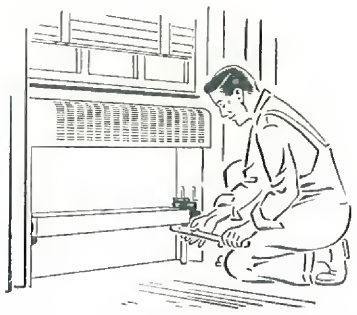
Old-fashioned cast iron radiators are definitely *passé* in a world that knows the beauty, cleanliness and greater comfort of these sleek cabinet convector-radiators made by John J. Nesbitt, Inc.

Nesbitt Convection Heating is the answer to perfect thermal environment at an appreciable saving.

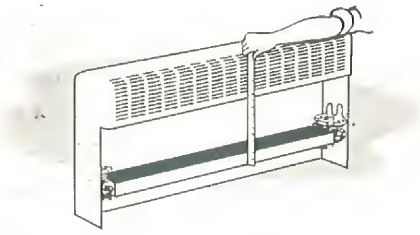
PUBLICATION 262 (superseding 252)

Printed in U.S.A. 8-50-30M

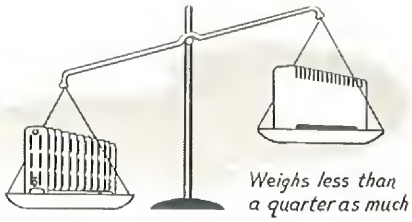
With Nesbitt Model U Convectors the toddler on the nursery or living-room floor and the grownups on the higher level enjoy the same uniform thermal comfort. Rooms are no longer divided from floor to ceiling into frigid, temperate and torrid zones. Nesbitt Convectors *radiate* heat moderately. Their principal mode of heating is the *convection* of air from the floor level, through the fin-and-tube heating element, and out the curved-top grille. This use of natural laws is quiet, effective, economical. The result is even temperature distribution and the elimination of cold floors and drafts. When desired, the convectors may be equipped with dampers for individual room control. Nesbitt Convectors combine ample heating capacity, compact size, and ease of application. The universal design of cabinet and heating element permits free-standing or semi-recessed installation, to two-pipe steam or hot-water systems, with savings of valuable manhours. A wide range of standard and special sizes, each unit assembled and packaged, is readily available through leading plumbing and heating wholesalers. Every Nesbitt Convector is fully guaranteed by the manufacturer.



The heating element of Nesbitt Convectors requires but two simple connections.



The curved-top grille makes for greater stack height — greater heating capacity.



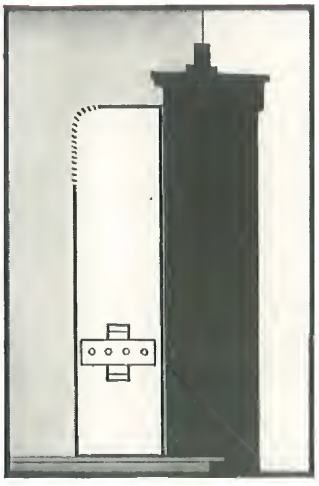
Cast-iron radiators were heavy, unwieldy. Nesbitt Convectors are trim and light.

Easy to Install

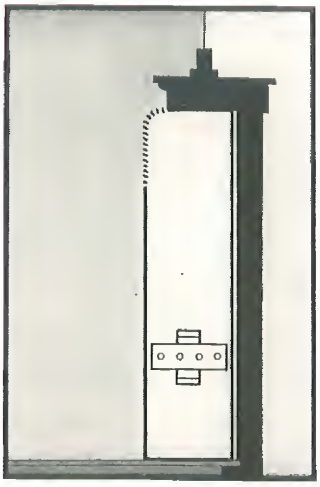
It is a pleasure to remove a Nesbitt Convector —in mint condition—from its protective carton and to place and install it where desired. The heating element requires but two connections, and it does not have to be removed from the casing. The time—the *money*—saved in installation is an important factor in reducing costs to the contractor, and consequently to the owner. Gone is the back-breaking labor and the risk to valuable home furnishings incurred in the handling of heavy radiators. Gone, that is, for all who have gone modern by going to Nesbitt Convectors.

Universal

Any Nesbitt Model U Convector may be installed free-standing or semi-recessed . . . to a two-pipe steam or a forced or gravity hot water system . . . up-feed or down-feed layout.



Free-standing



Semi-recessed

The Cabinet

THE CABINET of the Nesbitt Model U Convector is constructed with the top and a fixed portion of the front welded into one assembly with the sides and back.

The section of the front below the air discharge grille, normally held in place by metal screws located at the sides of the cabinet, is removable for interior access.

The top being fixed, the cabinet may be partially recessed up to a maximum depth of four-and-three-quarter inches and still permit access to the interior.

The front, sides, and top of the cabinet are made of 18-gauge steel, and the back, of 20-gauge. The corners and edges at top and sides are well rounded to prevent injuries and to enhance the appearance of the cabinet.

The discharge grille is of attractive louvre design, stamped integrally with the fixed portion of the front and top. The grille curves for a short distance around the top front edge, adding to cabinet appearance—and increasing stack height and heating capacity.

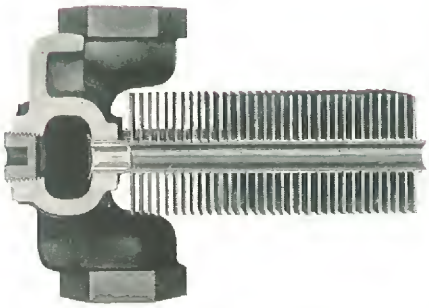
The Model U cabinet is exceptionally rigid. The top, the fixed portion of the front, the sides and the back, being welded into a single assembly, are compounded in strength. The bottom edges of the sides and the back are flanged inward to provide ample floor bearing. The front edges of the cabinet sides are offset by one thickness of metal to increase strength and to insure smooth fitting with the removable front. The fixed and the removable portions of the front are braced against buckling. Hence, the Nesbitt cabinet possesses high resistance to damage in shipping, installation and use.

All Model U convector cabinets are arranged for the inclusion of a heat control damper either at the time of installation or later (see page 7).

At each end of the front there is an access hole, to permit the manual operation of the air vent on hot water systems. These holes are masked by unobtrusive buttons that can be easily removed. Further details on the air venting of hot water systems are given on page 7.

Nesbitt Model U convectors are finished on all surfaces with a neutral gray semi-gloss primer which, if desired, may be given a finish coat after installation.

Heating Element



Cross section showing method of joining tubes to headers.

Close-up view of universal header.

Heating elements for Nesbitt Model U Convectors are constructed of round seamless copper primary tubes and flat aluminum extended fins. The fins have extruded collars which serve the dual purpose of spacing adjacent fins and of providing large areas of contact with the primary tubes.

The tubes are mechanically expanded to secure a permanently tight contact between tubes and fin collars. To protect the fin edges during installation and subsequent cleaning, the heating elements are equipped with metal side plates.

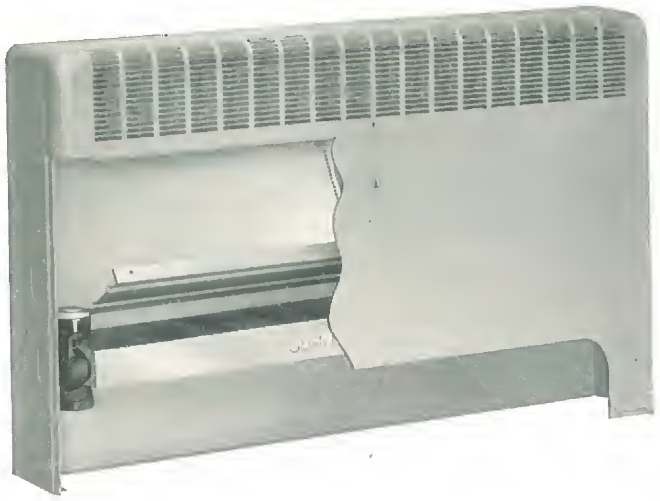
The heating element tubes are joined at each end to close-grained gray cast iron headers by leakproof mechanical joints. This is accomplished by inserting the tubes into machined holes in the header and then driving a tapered brass ferrule into the tube ends, creating a tight joint between tube and header wall. The tube-access holes on the opposite side of the headers are closed by threaded pipe plugs. See sectional view figure at left.

Model U convector headers are designed to meet a wide variety of connection arrangements. The headers at both ends of the element are identical and are provided with gooseneck connections at top and bottom. These are tapped ¾″ f.p.t. Also, two of the tube-access pipe plugs are ¾″ in size. Either of these may be used for connection purposes. Hence, the piping connections may be made at top, bottom, or end of the headers, suitable to all types of circulating systems.

The heating element is suspended from brackets at each end of the cabinet by four ¼″ bolts (two at each end) which thread into lugs on the cast iron headers. This permits the element to be adjusted vertically and to be pitched in either direction. Lock nuts are furnished on the bolts between the bracket and the header lug. These lock the headers in position after the proper adjustment for pitch has been made.

The fact that the headers are identical and that the element may be pitched in either direction eliminates the necessity of removing the element from the casing at the time of installation. This is a distinct labor-saving advantage.

HEATING ELEMENT PITCH. *Steam systems:* Pitch ½″ downward toward return end. *Up-feed hot water systems:* Pitch ½″ upward toward water outlet and air vent end. *Down-feed hot water systems:* Pitch ½″ upward toward feed end.



Heat Control Damper

Nesbitt Model U convectors are arranged for the installation of heat control dampers, either at the time the convector is installed or later.

The damper consists of a formed blade, hinged at the back of the cabinet just above the heating element. The damper is attached to a nickel-plated bead chain that runs up over a chain track and extends through a keyhole slot in the fixed part of the front. The exposed end of the chain has a metal pendant that cannot be removed and will not pass through the slot.

To regulate the heat output, the damper is raised or lowered. It may be fixed in an intermediate position by fastening the bead chain in the bottom slot of the keyhole. The front panel of the convector may be removed for cleaning the interior without disconnecting the chain.

Dampers are not installed at the factory but are packaged separately, with the operating chain, chain attachment, cotter pins for the hinges, and a set of instructions included in the carton.

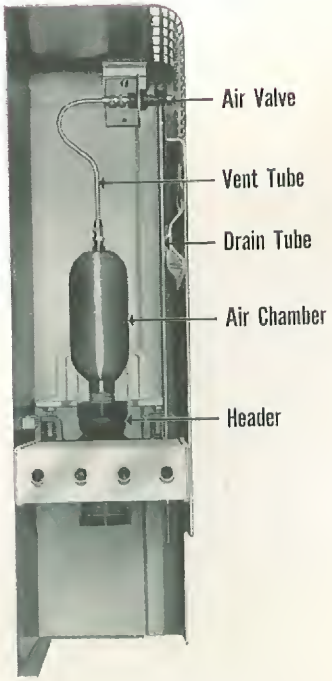
Air Venting–Hot Water Systems

On all up-feed hot water systems it is essential that provisions be made for venting each convector heating element at periodic intervals. Further, since the internal volume of the element is small, an air-storage chamber must be employed to provide space in which air can collect and so to increase the length of time between ventings.

Nesbitt Model U convectors are arranged for the installation of a key type air valve, held by a support clip and operated through an access hole provided in the cabinet at either end. These access holes are masked by easily removed buttons. The illustration shows the installation of air valve, valve support bracket with coupling, air chamber vent tube and fittings, and drain tube. The air chamber is fabricated, using a 2″ tube, and has an internal volume equivalent to 30 inches of ¾″ pipe.

All these items except the air valve are available from Nesbitt, packaged as a complete unit with a set of instructions. An air valve of the type illustrated should be purchased from others.

Location of the air valve within the cabinet makes for a neater and safer installation. Actual venting takes place at the high point, and the drain tube serves only to conduct any water from the valve into a small container placed beneath the heating element. The appearance of water in the container indicates that venting is complete, and it is not necessary to empty any connecting tubing of water before venting starts.



Inside sectional view

STANDARD MODEL U CONVECTORS

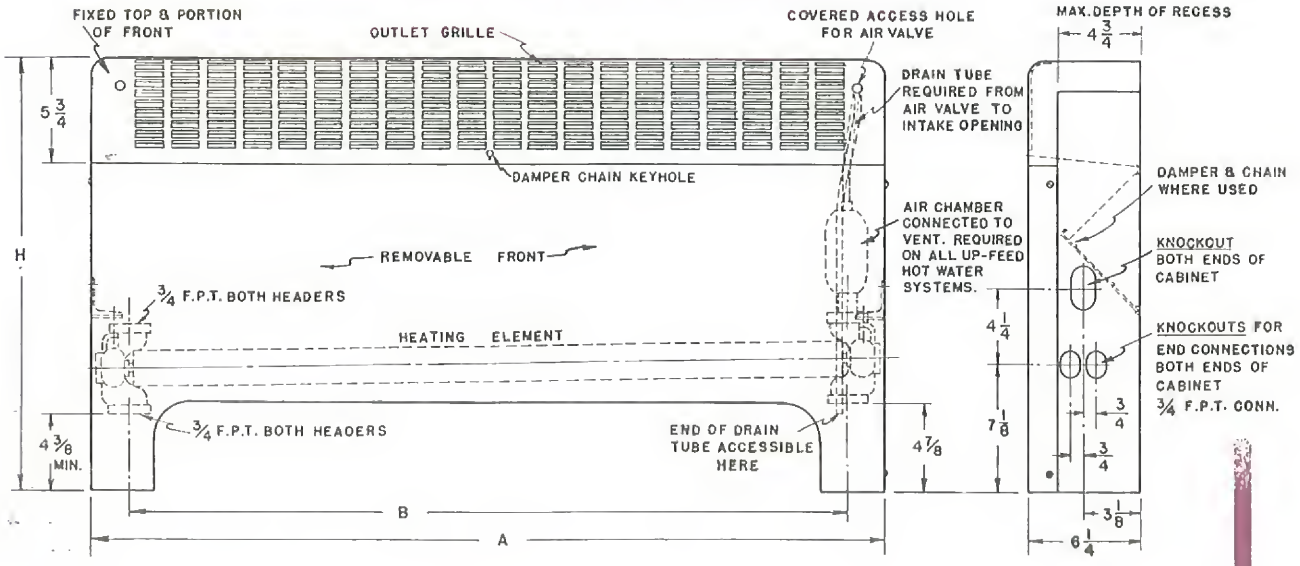


TABLE 1—DIMENSIONS

H = 20"	"A"	20"	24"	28"	32"	36"	40"	44"	48"	56"	64"
	"B"	15¾"	19¾"	23¾"	27¾"	31¾"	35¾"	39¾"	43¾"	51¾"	59¾"
	Model No.	U2020	U2024	U2028	U2032	U2036	U2040	U2044	U2048	U2056	U2064
H = 24"	"A"	20"	24"	28"	32"	36"	40"	44"	48"	56"	64"
	"B"	15¾"	19¾"	23¾"	27¾"	31¾"	35¾"	39¾"	43¾"	51¾"	59¾"
	Model No	U2420	U2424	U2428	U2432	U2436	U2440	U2444	U2448	U2456	U2464

Capacities

BASIS OF RATING

The ratings of these convectors have been determined in conformance with Commercial Standard CS140-47, as developed cooperatively by the trade and the National Bureau of Standards, U. S. Department of Commerce, and said ratings have been approved by the Convector Rating Committee.

In accordance with CS140-47, the following additions for heating effect have been made in the steam and hot water capacities: All 24" high convectors, 9%; all 20" high convectors, 13%.

TABLE 2—STEAM HEATING CAPACITIES

Basic Steam Ratings
One Pound Steam — 65° Entering Air

Cabinet Height "H"	Unit of Capacity	CABINET LENGTH "A" 20"	24"	28"	32"	36"	40"	44"	48"	56"	64"
20"	Sq. Ft. E.D.R.	17.0	21.0	26.0	29.5	33.5	38.5	43.5	46.5	55.5	63.0
24"	Sq. Ft. E.D.R.	18.5	23.0	28.0	32.5	36.5	42.0	47.5	51.0	60.5	69.0

Note: One square foot e.d.r. = 240 B.t.u. per hour.

CAPACITIES AT HIGHER STEAM PRESSURES

To obtain the heating capacities with steam above 1 lb. pressure, multiply the basic ratings given in Table 2 by the factor for the steam pressure from Table 3.

TABLE 3—FACTORS

For capacities in Table 2
65° Entering Air

Steam Pressure Lbs. Gage	2	5	10	15	20	25	30	35	40	50
Capacity Multiplier	1.04	1.10	1.19	1.28	1.36	1.43	1.49	1.56	1.60	1.69

STANDARD MODEL U CONVECTORS

FORCED HOT WATER HEATING CAPACITIES

Forced hot water heating capacities of Nesbitt Model U Convectors are given in two ways: (1) A direct-reading capacity table showing capacities in thousands of B.t.u. per hour; (2) The B.t.u. method, in which the capacity is expressed in B.t.u. per square foot of steam rating. The preference lies solely with the user. The same capacity is indicated for the same conditions by either method.

TABLE 4—M.B.H. (THOUSANDS OF B.T.U. PER HOUR) 65° ENTERING AIR

WATER TEMP. DROP	CABINET HEIGHT "H"	AVERAGE WATER TEMP.	CABINET LENGTH "A"									
			20"	24"	28"	32"	36"	40"	44"	48"	56"	64"
10° DROP	20"	160°	1.82	2.24	2.78	3.15	3.58	4.12	4.65	4.97	5.93	6.74
		170°	2.14	2.64	3.27	3.71	4.22	4.85	5.47	5.85	6.99	7.94
		180°	2.48	3.06	3.79	4.31	4.89	5.62	6.35	6.78	8.10	9.20
		190°	2.80	3.46	4.28	4.86	5.52	6.35	7.16	7.66	9.15	10.40
		200°	3.14	3.88	4.81	5.46	6.19	7.12	8.05	8.60	10.28	11.65
		210°	3.48	4.30	5.33	6.04	6.86	7.90	8.91	9.55	11.40	12.92
		220°	3.82	4.72	5.84	6.64	7.54	8.66	9.80	10.48	12.50	14.20
	24"	160°	1.98	2.46	2.99	3.48	3.90	4.49	5.08	5.45	6.46	7.38
		170°	2.33	2.90	3.52	4.09	4.60	5.28	5.98	6.42	7.61	8.70
		180°	2.70	3.36	4.08	4.74	5.33	6.12	6.93	7.45	8.83	10.09
		190°	3.05	3.80	4.62	5.36	6.02	6.93	7.84	8.41	10.00	11.40
		200°	3.42	4.26	5.18	6.02	6.76	7.77	8.79	9.45	11.20	12.75
		210°	3.79	4.72	5.74	6.66	7.49	8.61	9.74	10.47	12.40	14.15
		220°	4.16	5.17	6.30	7.31	8.21	9.45	10.70	11.48	13.60	15.52
20° DROP	20"	160°	1.73	2.14	2.65	3.01	3.42	3.92	4.43	4.74	5.66	6.42
		170°	2.00	2.48	3.06	3.48	3.95	4.54	5.13	5.48	6.55	7.43
		180°	2.28	2.81	3.48	3.95	4.48	5.15	5.82	6.22	7.43	8.44
		190°	2.57	3.17	3.92	4.45	5.06	5.81	6.56	7.02	8.39	9.50
		200°	2.84	3.51	4.34	4.93	5.59	6.43	7.26	7.76	9.26	10.50
		210°	3.13	3.86	4.78	5.42	6.16	7.09	8.00	8.55	10.20	11.60
		220°	3.40	4.20	5.20	5.90	6.70	7.70	8.70	9.30	11.10	12.60
	24"	160°	1.89	2.34	2.85	3.31	3.72	4.28	4.84	5.20	6.17	7.04
		170°	2.18	2.71	3.31	3.83	4.31	4.96	5.60	6.01	7.14	8.14
		180°	2.48	3.08	3.75	4.35	4.88	5.62	6.36	6.83	8.18	9.24
		190°	2.79	3.47	4.22	4.91	5.51	6.34	7.17	7.70	9.13	10.42
		200°	3.09	3.84	4.67	5.42	6.09	7.01	7.93	8.51	10.10	11.52
		210°	3.40	4.23	5.15	5.98	6.71	7.73	8.74	9.39	11.12	12.70
		220°	3.70	4.60	5.60	6.50	7.30	8.40	9.50	10.20	12.10	13.80
30° DROP	20"	160°	1.65	2.04	2.52	2.86	3.25	3.73	4.22	4.50	5.38	6.11
		170°	1.89	2.33	2.89	3.28	3.72	4.27	4.82	5.16	6.16	7.00
		180°	2.14	2.65	3.28	3.72	4.22	4.85	5.47	5.85	6.99	7.94
		190°	2.38	2.94	3.64	4.13	4.69	5.39	6.08	6.51	7.77	8.82
		200°	2.63	3.26	4.03	4.57	5.19	5.96	6.74	7.20	8.60	9.76
		210°	2.89	3.57	4.42	5.01	5.70	6.54	7.39	7.90	9.42	10.71
		220°	3.14	3.89	4.81	5.46	6.20	7.12	8.04	8.60	10.28	11.68
	24"	160°	1.79	2.23	2.72	3.15	3.54	4.08	4.60	4.94	5.86	6.69
		170°	2.05	2.55	3.10	3.60	4.05	4.66	5.26	5.66	6.71	7.66
		180°	2.33	2.90	3.52	4.09	4.60	5.28	5.98	6.43	7.62	8.70
		190°	2.59	3.22	3.92	4.54	5.11	5.88	6.65	7.14	8.46	9.66
		200°	2.86	3.56	4.34	5.03	5.65	6.51	7.35	7.91	9.38	10.70
		210°	3.14	3.91	4.75	5.51	6.20	7.14	8.08	8.67	10.30	11.72
		220°	3.42	4.25	5.17	6.00	6.75	7.76	8.78	9.44	11.20	12.78

STANDARD MODEL U CONVECTORS

FORCED HOT WATER HEATING CAPACITIES

B. T. U. METHOD

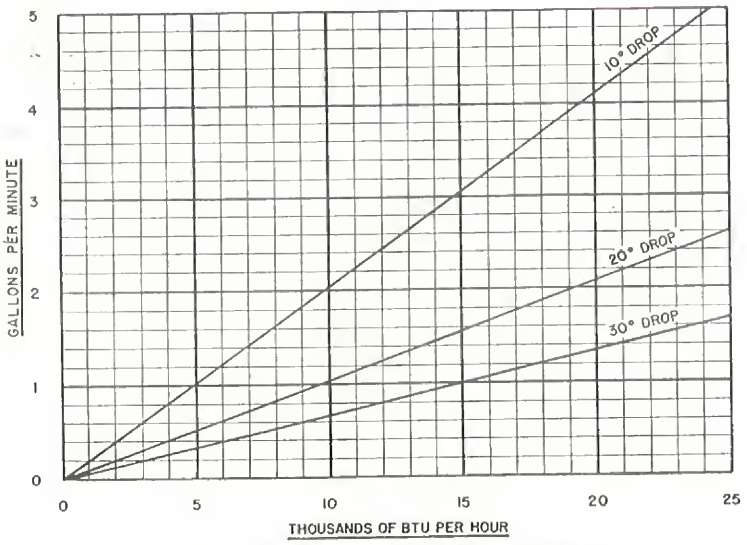
Forced hot water heating capacities of Model U convectors may be obtained by multiplying the B.t.u. per square foot of steam capacity corresponding to the average water temp. and water temp. drop from Table 5 by the basic steam capacity given in Table 2. This method may also be used in selecting convectors for an application as follows:

1. Determine from the heat loss of the space the capacity required of the convector in B.t.u. per hour.
2. Divide this B.t.u. per hour by the B.t.u. per square foot of steam capacity as shown for the design water temperature in Table 5. This gives the equivalent in steam capacity to be installed.
3. Refer to Table 2 and select the convector having the steam capacity computed in step 2.

TABLE 5—CONVERSION FACTORS

B.t.u. per Sq. Ft. Steam Capacity 65° Entering Air

Average Water Temp.	160°	170°	180°	190°	200°	210°	220°
10° Water Temp. Drop	107	126	146	165	185	205	225
20° Water Temp. Drop	102	118	134	151	167	184	200
30° Water Temp. Drop	97	111	126	140	155	170	185



Graph for determining G.P.M. required for various capacities (M.B.H.) and water temp. drops.

WATER QUANTITIES

To determine the required water quantity in gallons per minute (G.P.M.) for a Model U convector, first determine the heating capacity in M.B.H. from Table 4 (or from Tables 2 and 5), and then refer to graph to read the G.P.M. for that capacity and the water temperature drop used. The water quantity may also be calculated using the following relation:

$$\text{G.P.M.} = \frac{\text{M. B. H.}}{.485 \times \text{water temperature drop}}$$

TABLE 6—RESISTANCE TO WATER FLOW

Resistance in Inches of Water 20" and 24" High Cabinets

Water Rate G.P.M.	CABINET LENGTH "A" 20"	24"	28"	32"	36"	40"	44"	48"	56"	64"
.4	.15	.15	.16	.16	.16	.16	.17	.17	.17	.18
.6	.30	.30	.31	.32	.32	.33	.33	.34	.35	.36
.8	.52	.52	.53	.54	.54	.55	.56	.57	.58	.59
1.0	.76	.77	.78	.79	.80	.81	.82	.84	.86	.88
1.5	1.58	1.60	1.63	1.65	1.67	1.69	1.71	1.73	1.78	1.82
2.0	2.64	2.68	2.71	2.74	2.78	2.81	2.84	2.88	2.94	3.00
2.5	3.91	3.96	4.00	4.06	4.12	4.17	4.22	4.27	4.38	4.48
3.0	5.36	5.43	5.50	5.58	5.65	5.72	5.79	5.87	6.00	6.15
3.5	7.13	7.23	7.32	7.41	7.51	7.60	7.70	7.79	7.98	8.16
4.0	9.00	9.10	9.23	9.35	9.47	9.60	9.71	9.83	10.00	10.30

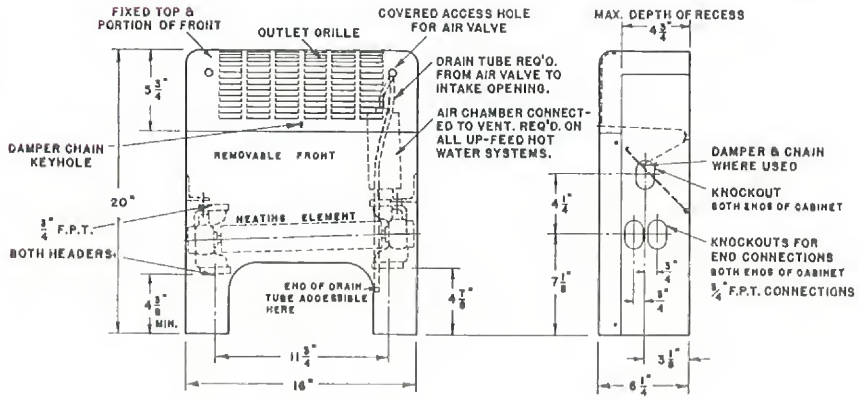
HEATING CAPACITIES WITH GRAVITY HOT WATER CIRCULATION

Model U heating capacities with gravity hot water circulation will vary with the height of convector above boiler, and the piping resistance. For average conditions, use the values shown in Table 4 or 5 for a 30° water temperature drop.

SPECIAL PURPOSE MODEL U CONVECTORS

BATHROOM CONVECTOR

MODEL U2016—Designed for use in bathrooms and other small enclosures with low heat loss.
Basic Steam Capacity: 13 SQ. FT. E.D.R., 1 lb. steam and 65° entering air. Additional capacity data, next page.



EXTRA LENGTH CONVECTORS

MODELS U2080 and U2088—Designed with extra capacity for unusual exposures, such as very long windows.
Basic ratings, Table 8, below. Additional data, next page.

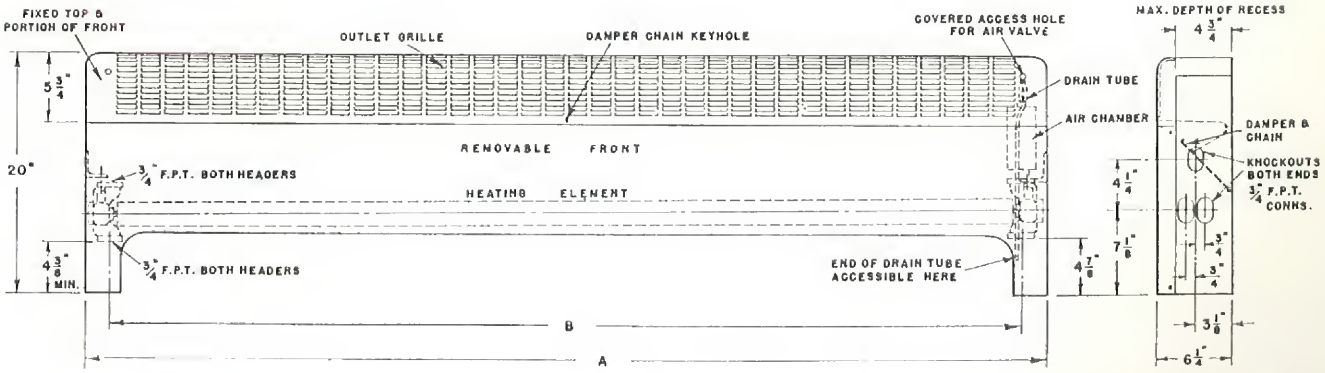


TABLE 7—DIMENSIONS

MODEL No.	"A"	"B"
U2016	16"	11¾"
U2080	80"	75¾"
U2088	88"	83¾"

TABLE 8—STEAM CAPACITIES

1 lb. Steam 65° Entering Air

MODEL No.	U2016	U2080	U2088
Sq. Ft. E.D.R.	13.0	80.0	88.5

For capacities at steam pressures above 1 pound, use the capacities given in Table 8, above, and the capacity multipliers given in Table 3, page 8.

SPECIAL PURPOSE MODEL U CONVECTORS

FORCED HOT WATER HEATING CAPACITIES

TABLE 9—M.B.H. 65° Entering Air (Thousands B.t.u. per hour)

WATER TEMP. DROP	MODEL No.	AVERAGE WATER TEMPERATURE						
		160°	170°	180°	190°	200°	210°	220°
10° DROP	U2016	1.39	1.64	1.90	2.15	2.40	2.66	2.92
	U2080	8.55	10.00	11.70	13.20	14.80	16.40	18.00
	U2088	9.46	11.10	12.90	14.60	16.40	18.10	19.90
20° DROP	U2016	1.33	1.53	1.74	1.96	2.17	2.39	2.60
	U2080	8.16	9.44	10.71	12.10	13.35	14.70	16.00
	U2088	9.03	10.45	11.85	13.35	14.78	16.28	17.70
30° DROP	U2016	1.26	1.44	1.64	1.82	2.02	2.21	2.41
	U2080	7.76	8.88	10.10	11.21	12.40	13.60	14.80
	U2088	8.57	9.80	11.15	12.40	13.71	15.05	16.40

ADDITIONAL DATA—FORCED HOT WATER

B. T. U. METHOD

If the B.t.u. method is preferred for hot water capacities, use the steam ratings given in Table 8, and the B.t.u. per sq. ft. factors given in Table 5, page 10.

WATER QUANTITIES

To determine the water quantities for special purpose Model U convectors, use the capacities from Table 9 (or from the B.t.u. method), and proceed as indicated under this heading on page 10.

CAPACITIES—GRAVITY HOT WATER

Use the capacities indicated for a 30° water temp. drop, employing Table 9 or the B.t.u. method described above.

TABLE 10—RESISTANCE Inches of Water

WATER RATE G.P.M.	MODEL NUMBER		
	U2016	U2080	U2088
.4	.14	.18	.19
.6	.29	.39	.39
.8	.51	.62	.63
1.0	.75	.92	.95
1.5	1.56	1.90	1.94
2.0	2.60	2.14	2.21
2.5	3.85	4.67	4.79
3.0	5.28	6.43	6.58
3.5	7.03	8.53	8.72
4.0	8.87	10.78	11.02
4.5	9.24	11.58	11.87

Guarantee

John J. Nesbitt, Inc., guarantees Model U Convectors to be of the capacities shown in this Publication and to be free of original defects in material or workmanship for a period of one (1) year from date of shipment from the factory. Nesbitt will repair or replace at its option, f.o.b. factory, any part or parts which upon inspection at its factory are found to be defective within this period. Said defective part or parts are to be returned to Nesbitt, all transportation charges prepaid. Nesbitt shall not be held responsible for any charges involved in the removal or replacement of material at the place of operation or for consequential damages arising out of any failure.

ARE FULLY ASSEMBLED IN INDIVIDUAL PACKAGES

Made by JOHN J. NESBITT, INC., State Road and Rhawn Street, Philadelphia 36, Pa.

Sold Exclusively through Plumbing and Heating Wholesalers

PUBLICATION 262 (superseding 252)

Printed in U.S.A. 8-50-30M